Evaluation of Mathematics, ICT and Technology 2023-2024
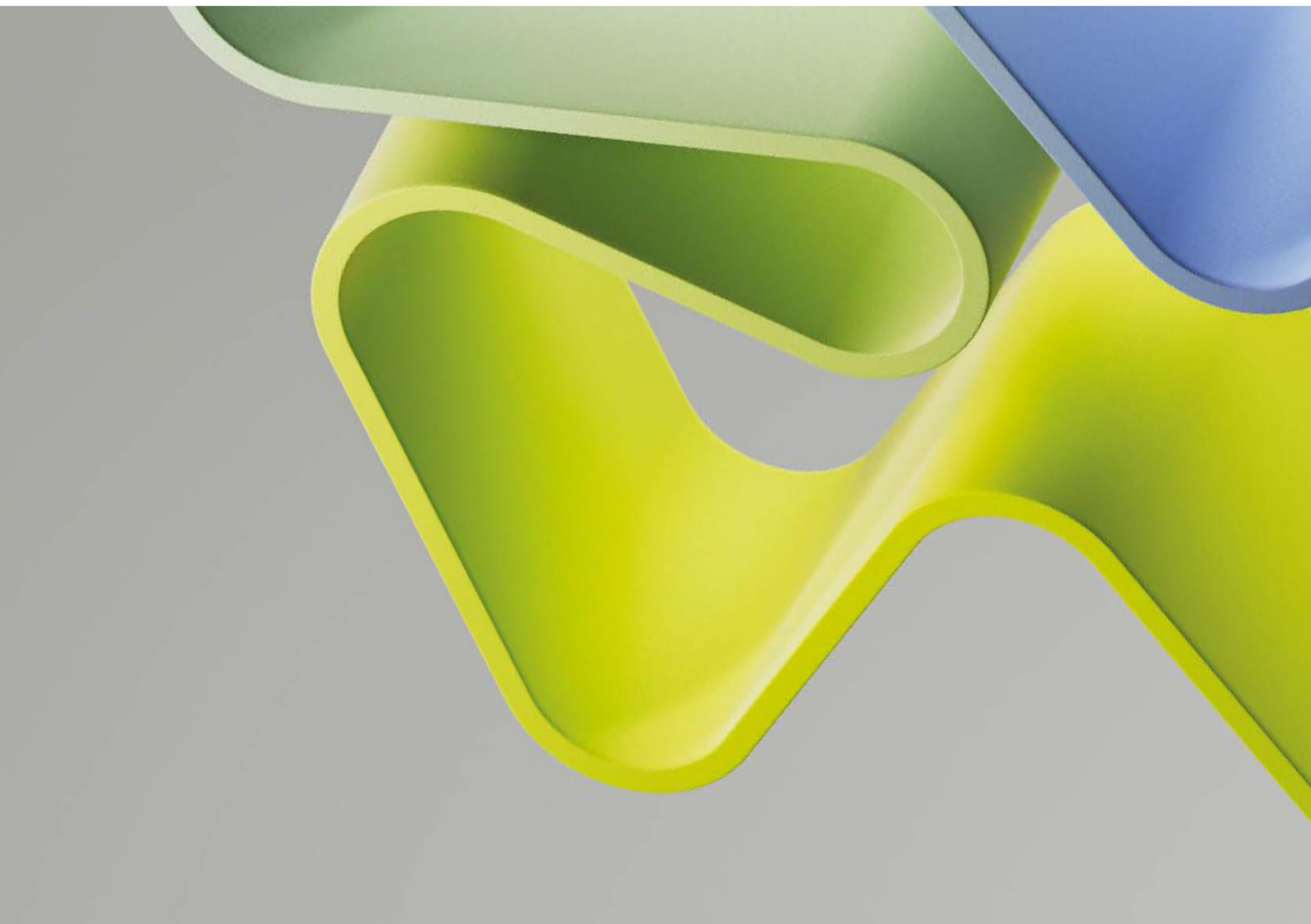
Evaluation Report for Administrative Unit

Administrative Unit: **Department of Information Systems (IIS)**

Institution: **University of Agder (UiA)**

Evaluation Committee Higher Education Institutions 2

December 2024

Contents

Statement from Evaluation Committee Higher Education Institutions 2

The members of this Evaluation Committee have evaluated the following administrative units at the higher education institutions within Mathematics, ICT and Technology 2023-2024 and has submitted a report for each administrative unit:

- Department of Computer Technology and Computational Engineering (IDBI), UiT The Arctic University of Norway

- Department of Automation and Process Engineering (IAP), UiT the Arctic University of Norway

- Department of Electronic Systems (IES), Norwegian University of Science and Technology (NTNU)

- Department of ICT and Natural Sciences, Norwegian University of Science and Technology (NTNU)

- Department of Information Security and Communication Technology (IIK), Norwegian University of Science and Technology (NTNU)

- Department of Engineering Cybernetics (DeptCybernetic), Norwegian University of Science and Technology (NTNU)

- Department of Information Systems (IIS), University of Agder (UiA)

- Department of Computer Science, Oslo Metropolitan University (OsloMet)

- Faculty of Science and Technology (REALTEK), Norwegian University of Life Sciences (NMBU)

- Department of Science and Industry Systems (IRI), University of South-Eastern Norway (USN)

- School of Economics, Innovation and Technology (SEIT), Kristiania University College

The conclusions and recommendations in this report are based on information from the administrative units (self-assessment), digital meetings with representatives from the administrative units, bibliometric analysis and personnel statistics from the Nordic Institute for Studies of Innovation, Research, and Education (NIFU) and Statistics Norway (SSB), and selected data from the National survey for academic staff in Norwegian higher education and the National student survey (NOKUT). The digital interviews took place in the autumn 2024.

The members of the Evaluation Committee are in collective agreement with the assessments, conclusions and recommendations presented in this report. None of the committee members has declared any conflict of interest.

The Evaluation Committee consisted of the following members:

Professor Jan Canbäck Ljungberg University of Gothenburg	Professor Bo Wahlberg (Chair) KTH
Professor Nancy Pouloudi Athens Univ. of Economics and Business	Professor Alessandra Costanzo University of Bologna
Professor Torsten Braun Universität Bern	Professor Stefan Wermter University of Hamburg

Description of the Administrative Unit

The Department of Information Systems (IIS) is an administrative unit from the University of Agder (UiA). IIS focus on three core areas of research: information systems design, digital innovation and transformation, and organisational targeted adoption and use of information systems. They were among the first higher education institutions to offer further education in sustainable digital transformation. Over the evaluation period the number of full-time professors has increased from three in 2013 to twelve professors in 2021. The number of associate professors has doubled from four to eight in the same period. In total the number of senior researchers has increased from seven to twenty. In 2021 the department was home to ten PhD students and two researchers, while back in 2013 it had only five PhD students and one researcher - The number is increasing, and in 2024, the department has 21 PhD students, 40% of them female. The department has been actively seeking to improve the gender balance, but this continues to be a challenge. A positive development was the significant increase in the share of women for PhD-positions, from 40% in 2013 to 90% in 2021. Another is an improvement in the number of women as full professors from 0% in 2017 to 33% (four full professors) in 2021.

IIS is actively involved in three multi-disciplinary research centres; the Centre for Integrated Emergency Management (CIEM), the Centre for Digital Transformation (CeDiT) and the Centre for eHealth. These centres are all cross-disciplinary, having members from different departments and even different faculties, but all of them were led by researchers from IIS in 2021. The centres' engagement is aligned with the interdisciplinary priority areas outlined in the university strategy. Their activities are relevant for all of the university's six priority areas: Technology in a changing society (all centres), The green transition (CeDiT), democracy and active citizenship (CeDiT), health and living conditions (CIEM and eHealth), learning and personal growth (all centres) and Art in society (CeDiT). Allocation of PhD students and postdocs is largely connected to centre activities. Further, the department has four more IT/IS-focused research groups; on systems development, socio-technical design, Human-cantered AI (HCAI) and ICT for development (ICT4D). Recruitment of permanent faculty is normally decided based upon research qualifications.

The Department of Information systems' vision is to be recognised among the top European research departments in the field of Information Systems and to be known for co-creation of knowledge, relevance to society and high-quality research. This is aligned with UiA's vision of "Co-creating tomorrow's knowledge" and mission "We co-create and disseminate knowledge in close collaboration with regional, national and inter-national partners."

Research impact is actualised via formalised collaborations, e.g. via the department's partner programme and the national GoForIT arena on digitalisation and sustainability (and also, from 2023, via the institutional collaboration agreement with NAV). Much of the research activity is organised in collaborative projects with public and private partners leading to transfer of knowledge. Moreover, centres and individual researchers contribute with policy input via consultative role in policy formulation through hearings, participation in consultative expert groups and participation in public debates.

Resources have been channelled into stimulating high-quality publications (through hours on individual workplans for publications in top journals). Between 2018 and 2022, IIS has secured a total of 31 grants, though most research conducted by the department is covered by the basic funding (±40% of research time).

IIS offers the full stack of study programmes; a 1-year program, a 3-year bachelor program, two masters programmes, a PhD specialisation, a specialisation on the faculty's executive

Master of Management, a range of further education courses and a planned executive master programme in digital transformation. All study programmes are research based and developed to support innovation in public, private and voluntary organisations. Teaching is generally based on the research front in information systems and niche domains such as digital government, crisis management, human-cantered AI, responsible digitalisation, ICT4D and eHealth. Students get jobs in a range of sectors and contribute to innovation based on the competences they obtained during their studies in close collaboration with the department´s public and private sector partners. The unit has hosted a number of industry and public PhD positions that are required to develop knowledge with clear and direct relevance for their employers.

Overall Assessment

The Department of Information Systems (IIS) of the University of Agder (UiA) has a clear and ambitious research vision and strategy, striving for excellence, international recognition and societal relevance. The research strategy has an excellent fit with that of the University of Agder. The department adopts a broad, interdisciplinary research agenda related to the study of information systems and their impact.

The administrative unit adopts a flexible and dynamic approach in its research organisation, which is appropriate given the fast-moving field it studies. This entails collaboration among staff members with different backgrounds, interests in diverse research application areas and methodological approaches, who work together with colleagues from other faculties and departments of the university, but also with colleagues working in information systems nationally and internationally. This diversity and interdisciplinarity is considered a strength by the department and is central to its culture, hence it is one of the aspects in the Terms of Reference that the department has signalled as important to its evaluation. The Evaluation Committee finds that interdisciplinarity and diversity indeed have contributed to creating an open culture, which in turn has supported the ongoing growth of the department in research staff as well as in PhD students and has fostered international collaborations. Nonetheless, diversity also poses risks in the coordination of research, such as lack of focus and overlaps among research groups. To avoid such issues, the department needs to monitor closely how research is coordinated within and across groups.

In its research engagement and production, the department has achieved international recognition, due to the high visibility of its research staff and the outreach of their research. This is reflected in the very high publication output in relation to other administrative units in the same research area. It is also recognised internationally for its contribution to high quality publication outputs in the information systems field. The department is also well positioned in attracting national and international funding. Research integrity is highly appreciated, and the department is taking measures to increase its publications in open access. All these aspects of research production, quality and integrity are facilitated by the strong developmental culture and multiple mentoring initiatives within the department. These have also contributed to an environment that supports diversity and equality. The department is taking active measures to improve its current gender balance, which is not ideal but has been substantially improving during the evaluation period,

The department values international networking, another focal aspect in the Terms of Reference that the department has signalled as important to its evaluation. The Evaluation Committee finds that the department has made remarkable achievements in this area, as it is recognised as an important hub for European research in IS. This has been achieved by encouraging both incoming and outgoing mobility, hosting international staff and high-profile visitors but also by hosting the most prestigious conference in information systems in Europe (ECIS).

The final focal aspect in the Terms of Reference for the department is the relevance and impact to society. The self-assessment report and the impact cases submitted provide a convincing case that the research in the department caters to different audiences, and has had significant social impact related to resilience management, education, public welfare services. The department has partnerships and collaboration agreements with government organisations, IT and related industries, health organisations and emergency response organisations. These strengthen its links and relevance to local and national needs. This creates a virtuous cycle that includes research, industrial and societal partnerships, and

education; teaching is both research-led and informed by industry and is offered at different levels and for different audiences.

Overall, the department adopts a lot of good practices that should be maintained and reinforced. It is an extrovert department, open to innovation and national and international networking, that is on course to achieve its objectives. The following section of this reports provides some specific recommendations to assist the department in sustaining and improving its excellent standing.

The Terms of Reference for the administrative unit is attached to the report.

Recommendations

The main recommendations from the Evaluation Committee to the Department of Information Systems (IIS) are to:

1. **Coordinate research across the research centres**
   - Create synergies and avoid unnecessary overlaps
   - Ensure interdisciplinarity is properly orchestrated
   - Think systematically and strategically, when recruiting new staff from the department or members from other faculties in the research groups
   - Ensure resources are clearly agreed and communicated among participating departments or faculties to avoid future conflicts
   - If such collaboration is not already foreseen, create mechanisms (e.g., research seminars) to showcase research results across the units engaged in related research projects and build synergies.
2. **Target high-quality and open access research publication outlets**
   - Actively pursue publication of more papers in high quality journals
   - Ensure that academic staff is aware of opportunities and funding for open access publications
   - Maintain and evaluate the courses provided for open access publishing and research data management
3. **Disseminate research results broadly**
   - Ensure that both senior and junior academic staff engage in exploring how research results may be disseminated most effectively to all relevant stakeholders
   - Maintain the good practice of encouraging and facilitating the broad dissemination of research results and making such results accessible for societal use, where relevant
4. **Pursue external funding and use of research infrastructures**
   - Continue the efforts to attract national and international funding
   - Maintain access to research infrastructures that facilitate high-quality research work
5. **Extend good practices in international networking**
   - Maintain the high level of national and international collaboration, and consider additional partnerships beyond Europe
   - Maintain the good practices related to staff mobility and hosting of high-profile international researchers
   - Monitor the impact of incoming and outgoing mobility, particularly in relation to longer-term benefits (e.g., joint degrees or research projects)
6. **Continue working in the direction of enhancing gender-balance**
   - Exploit staff development plans and annual reviews to encourage an inclusive and gender-balanced professional growth strategy

These recommendations aim to support IIS in reaching its full potential in terms of its research, sectorial and societal impact, nationally and internationally.

1. Strategy, Resources, and Organisation of Research

The self-assessment report presents a clear and ambitious research vision and strategy for the administrative unit, that is in line with the University of Agder's vision of "Co-creating tomorrow's knowledge". The vision of the Department of Information Systems is "to be recognised among the top European research departments in the field of Information Systems and to be known for co-creation of knowledge, relevance to society and high-quality research". The department strategy is centred around the notion of high-quality/excellent research and adopts a broad research agenda related to the study of information systems and their impact. The research direction is clear and in line with the university's strategy. Further details are presented in Section 1.1 of this report.

The administrative unit is home to three interdisciplinary research centres, the Centre for Integrated Emergency Management (CIEM), the Centre for Digital Transformation (CeDiT) and the Centre for eHealth. The centres are led by researchers from the Department of Information Systems but bring together members from different departments or faculties in an environment that fosters interdisciplinary research. This diversity on the one hand constitutes a strength but on the other hand presents a challenge for the coordination of research efforts within and across research groups. The department has grown substantially over the evaluation period, from 7 senior professors in 2013 to 20 in 2021. Similarly, the number of PhD students has doubled during the evaluation period and continues to grow, according to the interview with the administrative unit. The organisation of research in the unit is reviewed in detail in Section 1.2 of this report, while the research staff employed in Section 1.6. The unit emphasises its proactive role in establishing collaborations with both national and international partners (see Section 1.5), as these are central to the implementation of its research strategy. This report draws attention to the good practices pursued by the department in its research organisation, which also relate to the sources and amount of external funding secured (reviewed in Section 1.3). The remainder of this chapter reviews the infrastructures used to support the research process (Section 1.4) and the strategy towards publishing in open access (Section 1.7).

1.1 Research Strategy

The vision of the Department of Information Systems (IIS) is to "be known as a top European IS research department, recognised for an outstanding working environment, co-creation of knowledge and relevance to society, as well as high quality research and attractiveness to students". The research strategy of the unit has an excellent fit with the strategy of the University of Agder, where "co-creation of tomorrow's knowledge" is the central vision and motto. It is also fully aligned with the strategy of the Faculty of Social Sciences, as well as with national strategies. The department emphasises high quality research and provides support to its research staff, primarily through mentoring and training, by allocating time and resources, and by encouraging international collaborations and incoming and outgoing international mobility.

By definition, research on information systems is interdisciplinary. The administrative unit is well placed to support such research, bringing together research staff with diverse methodological competences and skills and diversity in research application areas, while also orchestrating collaboration with other faculties and departments within the research centres that it manages. During the interview with the Evaluation Committee, the department

explained that its research organisation is dynamic, in the sense that new research areas are explored through a bottom-up approach, with researchers forming groups based on shared interests. While the process is mostly organic, some top-down strategies guide recruitment to where gaps in expertise are perceived, with a focus on balancing groups numbers and focus areas.

Within the research centres, the administrative unit have set a number of collaborative projects with public and private partners – a recent, ongoing collaboration with NAV is notable for its high impact (please refer to the third impact case in this report for more information). In addition to funded research projects with other academic partners, nationally and internationally, the department places significant emphasis on international collaboration, in many forms (e.g., joint research projects, mobility, joint publications, participation in international events, and acting as mentors in international doctoral consortia). The decision of the department to host the European Conference on Information Systems (ECIS) in 2023, has been instrumental in confirming its status as a hub for European research in information systems.

As noted during the interview with the Evaluation Committee, the department values diverse research outputs, balancing top-tier journal publications with practical impact on industries like healthcare. The unit encourages flexibility, supporting both theoretical academic contributions and applied research with real-world impact. The research output quality of the unit is reflected in both the EVALMIT Publication and citation analysis and the Association for Information Systems ranking reports. To support the research activities in the unit, a developmental environment is provided. Central values of the department are to be inclusive and collaborative; critical and analytic; responsible and ethical; and creative and curious. The department has thus achieved to create an open and inviting culture that attracts high-profile international visitors, but crucially, has enabled its substantial, ongoing growth, both in terms of research staff and in PhD student numbers.

Recommendations to the administrative unit:

- The Evaluation Committee recommend allocating staff resources to coordinate research across the research centres, in order to balance their organic growth with the need to create synergies and avoid unnecessary overlaps. This could be achieved, for example, by joint research and PhD seminars with participation of researchers belonging to different research centres.

1.2 Organisation of Research

Research in the Department of Information Systems is organised in three multi-disciplinary research centres, two of which (CIEM and CeDiT) are evaluated within this administrative unit. Two more research groups have been recently established. The head of department is responsible for managing human resources, including allocating time for research and facilitating research activities. This is one of three key leadership roles to support research organisation, including also the research coordinator and the leader of the PhD specialisation in information systems. The three roles thus represent all internal research stakeholders and have clear responsibilities, most of which are shared. In addition to responsibilities that would be expected, such as stimulating research publications and facilitating applications for external funding, it is noteworthy that there is explicit mention to the broad dissemination of research results so that they are accessible for societal use, while researchers are encouraged to participate in the public discourse. This goes beyond the strategic emphasis on high-quality/excellent research.

It is commendable that all research groups are interdisciplinary and have members from other faculties of the university. However, this could create a challenge for resource management. It is not clear how resources are coordinated among the departments/faculties whose staff are engaged in research groups (the self-evaluation report only reports activities within the administrative unit).

The administrative unit is also to be commended for its appreciation and facilitation of synergies between research and teaching activities. This entails encouraging research-led teaching and organising teaching allocation In line with the research interests of staff, as well as the allocation of time for research. In addition, a lot of emphasis is placed on staff development. Throughout the assessment report, it is clear that the department has both formal (yearly development conversation with the department head, research training) and informal (informal feedback, knowledge exchange with international visiting researchers) mechanisms to support staff development. This commitment to staff development and mentoring was reaffirmed during the interview with the administrative unit.

Recommendations to the administrative unit

- The Evaluation Committee recommend maintaining the good practice of encouraging and facilitating the broader dissemination of research results and making such results accessible for societal use, where relevant.
- The Evaluation Committee recommend that both senior and junior academic staff engage in exploring how research results may be disseminated most effectively to different relevant stakeholder audiences
- The Evaluation Committee recommend ensuring resources for staff, including time allocated to research, are clearly communicated among departments/faculties to avoid future conflicts.
- The Evaluation Committee recommend the administrative unit consider how interdisciplinarity is orchestrated, so that it remains a strength for the unit. This includes thinking systematically and strategically, whether recruiting new staff in the department or members from other faculties in the research groups.
- The Evaluation Committee recommend, if such collaboration is not already foreseen, to involve the chairs of departments that have members in the research centres of the unit in a discussion to commit resources in a coordinated manner and create mechanisms (e.g., research seminars) to showcase research results across the units engaged in related research projects.

1.3 Research Funding

The administrative unit has been successful in attracting research funding of over 26 million NOK for the period 2018-2022. Of this amount, 75% comes from national funding, including industry and the public sector, about 23% is from international grants, including five grants from the EU, and 2% from national contract research grants funded by the industry. Even though basic funding remains the primary source of funding, the unit has been managing a total of 31 grants. Taking into account the size of the unit, the level of funding and research project management is significant. There is scope for extending the funding from international grants, as these are expected to have multiplier effects in enhancing further the unit's reputation and contribute to higher academic and societal impact. The department can exploit its extensive international network to explore opportunities for further collaborations.

According to the self-assessment report, external funding has been instrumental in facilitating growth and innovation within the administrative unit. The research funding is also contributing to the broad-reaching societal impact of the unit, as evidenced by the impact

cases presented (see Section 5.1 of this report for details). It is worth noting that the administrative unit provides support to its members for the preparation and management of grant applications, as part of its mentoring strategy. This is an important practice that can empower junior members of the department become engaged in the grant application process.

Recommendations to the administrative unit:

- The Evaluation Committee recommend continuing the efforts to attract national and international funding, to minimise dependence on basic funding and strengthen the reputation and visibility of the unit

1.4 Research Infrastructures

The self-assessment report presents in detail the research infrastructures that are used by the administrative unit. These include research databases and research software for both qualitative and quantitative analyses, and the extensive electronic library and other research and teaching resources of the Association for Information Systems. There is also access to an Open Access fund to support the publication of research in open access. These resources are appropriate to support the needs of the administrative unit.

Additionally, according to the self-assessment report, the unit follows the university´s principles and guidelines for data management. It provides an extensive account of the actions done to fulfil the FAIR principles. Specifically, the faculty equips research data with standardised metadata, enabling future use of data content. This process is particularly relevant for data that cannot be made openly accessible. Metadata are updated whenever available datasets are updated or supplemented with new data. The unit appears to understand FAIR principles and operates in line with international standards and licenses for access, reuse, and redistribution.

Recommendations to administrative unit

- The Evaluation Committee recommend maintaining access to research infrastructures that facilitate high-quality research work

1.5 National and international collaboration

The administrative unit maintains an extensive network of collaboration, nationally and internationally. The international network of the unit is exceptional, and the self-assessment report illustrates its instrumental role in enhancing research work, attracting research funding, and, importantly, amplifying professional development opportunities for both senior and junior researchers in the unit. Examples of institutionalised international collaboration are the participation in the *ERCIS* research network and the *Forthem* university alliance. Additional collaboration is enabled by international visits of high-profile researchers. The strength of the collaborative tradition of the unit is reflected in the NIFU bibliometric report, which shows consistency in the last four years in the share of publications with international co-authors (ranging from 35.6-42.4%), mostly with German and Swedish institutions. The respective shares of collaboration with national co-authors are slightly lower (29.4-33.9%). Both types of collaboration are fruitful as reflected in the ranking of the University of Agder among the top three higher education institutions with largest publication output in ICT and in Mathematics, ICT and technology-overall, according to the EVALMIT Publication and citation analysis.

In addition to the research collaborations, the administrative unit has a clear strategy for partnerships with practice. Specifically, these are not only used as opportunities for research

activity and funding, but also to ensure relevance of study programmes and to support student projects studying real-world problems. Most notable is a recent formal 5+3-year collaboration agreement between NAV and UiA, where the Department of Information Systems serves as contact point. The department also favours hybrid collaboration of industrial and academic partners and has been among the leaders in the establishment of GoForIT, described in the self-assessment report as Norway´s knowledge arena in the intersection between digitalisation and sustainable development.

Recommendations to administrative unit:

- The Evaluation Committee recommend maintaining the high level of national and international collaboration, but considering expanding the collaboration and joint publications with partners also from outside Europe

- The Evaluation Committee recommend striving to publish more papers in high quality journals (e.g., the list of premier journals defined by the College of Senior Scholars of the Association for Information Systems)

- The Evaluation Committee recommend monitoring and exploring the long-term benefits from international visits (e.g., in education: consider joint/dual degrees and PhDs; in research: monitor how joint projects and joint publications over time reinforce research visits and vice-versa)

1.6 Research staff

The administrative unit has grown substantially during the evaluation period, with the number of senior researchers (full and associate professors) growing from seven to twenty and the number of PhD students doubling from 2013 to 2021 and continuing to grow since. Recruitment is decided based upon research qualifications, in line with the department's strategic emphasis on high-quality/excellent research. According to NIFU, about 40% of full professors and 30% of associate professors have a foreign PhD degree. This reflects an openness to different research traditions and paradigms. At the end of the evaluation period the department had 12 full professors (33% female); 8 associate professors (25% female); 2 researchers & post-docs (both male); 10 PhD students (90% female). The proportion of full professors is relatively high; this probably reflects the growth strategy of the unit. The gender balance has improved over the years but is not yet ideal (see also Section 3 of this report). The number of PhD students in the evaluation period was relatively low compared to the number of senior research staff. However, during the interview, the administrative unit informed the Evaluation Committee that their number has since doubled, with 21 PhD students being presently enrolled.

The self-assessment consistently reports a developmental environment, with development plans and annual development reviews for all research staff, as well as informal feedback within the research groups, across the department and in collaboration with international visitors (see also Section 1.2 of this report). Research time is distributed equally among researchers (approximately 40% research time for senior researchers) and workload, including any teaching and service overtime, is documented in each researcher's account for academic development (konto for faglig utvikling (KFU)), ensuring fairness, transparency and facilitating planning for research and sabbatical leaves. Incoming and outgoing research mobility is strongly supported and encouraged. The administrative unit clearly promotes international collaboration, which is viewed as a vehicle for mentoring, professional development and feedback, as well as for increasing research funding and creating additional high-quality publication opportunities.

- The Evaluation Committee recommend prioritising recruitment at the associate professor level in future expansions, to ensure a more balanced seniority ratio in staff

- The Evaluation Committee recommend exploiting the development plans and annual reviews to encourage an inclusive and gender-balanced professional growth strategy

- The Evaluation Committee recommend maintaining the good practices related to staff mobility and hosting of high-profile international researchers

- The Evaluation Committee recommend continuing the effort to recruit more PhD students, aiming to have at least two students per full-time research staff member

1.7 Open Science

The administrative unit follows the guidelines and policies of the university of Agder related to Open Access, data management and publication policies. The university is part of the SIKT consortium, offering agreements and discount agreements with academic publishers. The self-assessment report provides details of the relevant documents and research archives that are in use.

Additionally, it is noted that financial support can be granted to the corresponding author for publication in pure Open Access journals. This is an important measure to promote open research publications, particularly as the field of information systems does not have a long tradition (compared, for example, to computer science) of making research publications open access.

At present, according to the Nordic Institute for Studies of Innovation, Research, and Education (NIFU), the proportion of open access publications has increased substantially since 2019, with typically more than half (49.2% in 2022) publications being open access and an additional 7-10.2% being gold open access. The department is moving in the right direction and could work towards further improvement in the proportion of its open access publications.

Recommendations on how to promote open science

- The Evaluation Committee recommend ensuring that academic staff is aware of opportunities and funding for open access publications to enable a growing proportion of publications to be open access. In this respect, the courses provided for open access publishing and research data management are important and should be maintained and evaluated

2. Research production, quality and integrity

The administrative unit carries out research on information systems, focusing on information systems design, digital innovation and transformation, and organisational targeted adoption and use of information systems. These topics are at the core of the information systems discipline. The department maintains a broad research agenda within the information systems field and, according to the self-assessment report, perceive diversity (in research application areas, in methodological competences and skills, in geographical reach of the research) as internal strengths. However, such diversity can also be a challenge, as it is more demanding to build an international research reputation when research is not focused on specific areas or technologies. Nonetheless, the department has achieved international recognition, due to the high visibility of its research staff and the outreach of their research. As an indicator of the high quality of research, the department is listed among the top 16

Information Systems departments in Europe according to the Association for Information Systems (AIS) research ranking, based on publication in 8 premier journals for the period 2020-2022. As an indicator of the high quantity of research, the department is ranked among the top three higher education institutions with largest publication output in ICT as well as in Mathematics, ICT and technology-overall, according to the EVALMIT Publication and citation analysis.

The self-assessment report provides a detailed description of the unit's policy for research integrity, both for conducting and for publishing research. This is in accordance with national and international ethical standards. The university has a dedicated ethics committee, and every research with potential impacts on human participants is subjected to a rigorous evaluation. The department follows the Norwegian Research Ethics Act (Forskningsetikkloven) and observes research conducts debated internationally. It is indicative that the Research Conduct Committee of the Association for Information Systems is chaired by a professor (now retired) of the administrative unit. The research unit acknowledges the ethical challenges of information systems research, in particular, where the object of study progresses fast and in unpredictable, unprecedented ways. To ensure fairness in publication, the department asks for a transparency statement on each author's contributions for every coauthored paper. Overall, it is stated that Researchers at UiA are obliged to know and follow established research ethical standards and guidelines, both within their field and the general guidelines of the university.

The assessors of the research groups of the unit recognise interdisciplinarity as both a strength and a weakness and argue that both groups should develop a clearer research profile and strive for higher quality and visibility in their publications. The Evaluation Committee understands the challenges of evaluating interdisciplinary research. In the case of this administrative unit, in particular, whose subject is information systems, interdisciplinarity is at the core of any research endeavour. As a consequence, research output may be judged differently depending on the epistemological and scientific lens adopted. It is notable, that the unit, as a whole, has achieved significant international recognition and visibility, and its output is judged as of the highest quality by the Association of Information Systems, while the University of Agder is listed among the top Norwegian institutions in the number of publications in ICT. Furthermore, at unit level, the amount of funding secured is substantial. Thus, the unit presents a much stronger research profile than its research groups, when evaluated separately. This may be because of the participation of staff from different departments and faculties, which may influence the perceived cohesion within the research centres. The research unit should therefore dedicate resources for better coordination of research across its research centres, also bringing in the centres that have been recently established.

2.1 Research quality and integrity

Research group Centre for Integrated Emergency Management (CIEM) overall assessment

- Strength: The group is relatively large (24 professors and 14 researchers) and interdisciplinary by nature (staffing from 3 faculties and 5 departments). There is a clear organisational structure with a steering group the CIEM manager and the administrative manager. CIEM's focus of research is on societal security and civil preparedness, which continuously gained relevance in the European governments and the World Health Organisation (WHO). Hence, CIEM can strategically allocate a major role in research.

- Weakness: Compared to the size of the group, the basic funding from 2018 until 2021 was too low but increased to 4 Mio NOK in 2022, which is better suited. The quality of research – in terms of advancing the state-of-the-art – is low, with only a few citations of major papers of the group. The five research fields are too broad and not distinct enough to shape a clear research profile and collect specific competences.
- Overall performance: In the international context, the overall performance of the group is rather low, lacking sufficient social contributions and user involvement.

Research group Centre for Digital Transformation (CeDiT) overall assessment

The CeDiT at UiA presents a mixed picture in terms of its strengths, weaknesses, and overall performance, with several notable areas for improvement. CeDiT's primary strength lies in its clear research focus on exploring the consequences of digital transformations in four thematic areas, which aligns well with contemporary societal and technological challenges. The interdisciplinary nature of the group allows it to address complex questions surrounding these digital transformations comprehensively. Additionally, the centre's commitment to gender balance and supporting female researchers adds a commendable dimension to its organisational culture. However, CeDiT faces significant challenges. Despite its large size, the centre's international visibility and the impact of its research output are limited. The research quality is sufficient to achieve national recognition and occasionally reaches internationally recognised standards, but these instances are not consistent enough to deem the group strong in an international context. Publications and projects, while solid, often do not meet the highest standards of international scientific quality that would ensure wider visibility and impact. Funding emerges as a significant concern, with the centre relying heavily on national sources like the Research Council of Norway, and showing limited success in securing competitive international funding. This indicates a strategic shortfall in clear, actionable goals and benchmarks essential for guiding the centre toward achieving more ambitious objectives in a competitive global research environment. Moreover, although CeDiT has potential for impactful societal contributions, especially relevant in the context of digital transformations, the mechanisms for translating research into tangible societal benefits are inadequately documented and developed. The centre's engagement with non-academic partners and its activities in knowledge transfer are areas that require further development to enhance societal impact.

3. Diversity and equality

The University of Agder has an Equality and Inclusion Committee (LIU) appointed by the University Board, with representation from all Faculties and from both staff and students. Its aim is to promote equality "regardless of gender, ethnicity and functional abilities" as stated at the self-assessment report and the University's web site. The "Action Plan for Equality, inclusion and diversity at UiA" is also publicly available. The administrative unit is therefore well aligned with the university's gender equality plan and present in its diversity and equality promotion processes.

Nonetheless, the self-assessment report acknowledges that gender balance remains a challenge for the administrative unit. In line with the university's policy, inclusive recruitment strategies have helped increase the number of senior female staff. This was confirmed during the interview with the administrative unit. In particular, the number of full professors has grown from zero to four, accounting for 33% of full professors. The proportion of female Associate Professors is lower (24%), yet 90% of PhD students are female.

The extensive mentoring, the developmental plans and the annual development review that the academic unit employs for all staff can serve as high-impact measures to attract more female senior researchers but also to support and help the internal promotion of current staff. The Evaluation Committee finds that the administrative unit is well aware of the importance of a diverse and balanced environment and actively pursues targeted measures to improve gender balance. Furthermore, targeted development opportunities to support career progression for women were mentioned in the interview with the administrative unit and constitute an additional good practice for achieving and maintaining a better gender balance across different levels of seniority. The increasing share of female full professors indicates that some measurable results have already been achieved.

4. Relevance to institutional and sectorial purposes

The research staff of the administrative unit pride themselves in their engaged scholarship, particularly in collaboration with government organisations (state and local), IT and related industries, health organisations and emergency response organisations. Collaboration occurs formally through a partner program and through collaboration within GoForIT, that the unit co-established. The unit has a strong record of public sector partners, thus contributing to societal impact (see also Section 5 of this report). Research output is also communicated through appropriate means to the public at large. Two examples of research commercialisation are presented in software and an administrative innovation service (UiA Nyskaping) that enables technology and knowledge transfer. According to the self-evaluation report, while motivation for innovation is high, motivation for commercialisation remains low. To cater for the lack of incentives and support related to the latter, the University is preparing a new set of Principles for Commercialisation.

The administrative unit contributes to the education sector by supporting education needs at different levels and for different audiences, as it offers a 1-year program, a 3-year bachelor program, 2 master programmes, a PhD specialisation, a specialisation on the faculty´s executive Master of Management, a range of further education courses and a planned executive master programme in digital transformation. The unit adopts a well-organised approach for engaging master students in research, offering an internship program and organising a 'marketplace' for master's theses to ensure a good match of research interest between students and potential supervisors. Student participation is research may also be supported by internal funding by the university. Staff join in PhD-level training in collaboration with the University of Oslo as well as internationally at doctoral consortia and PhD seminars. These activities confirm the extrovert research orientation of the administrative unit.

Furthermore, the research unit is active in conferences and workshops related to the information systems field and have successfully organised the 31st European Conference on Information Systems in 2023 (preparation for this prestigious event had started within the evaluation period). The self-assessment report gives examples of research staff from the unit being engaged in external project evaluations at the European Commission and in standardisation associations. These are remarkable achievements. Finally, the unit exploits the partner program with public and private sector organisations to ensure relevance in curriculum, thus reinforcing its impact.

5. Relevance to society

According to the self-assessment report, the administrative unit contributes to the Norwegian long-term plan for research and higher education, and places emphasis on enhancing competitiveness and innovation capacity, environmental, social and economic sustainability, societal security, and civil preparedness.

The administrative unit organises its collaboration with public and private organisations systematically through its partner program and collaboration agreements. These structures and mechanisms constitute good practice for maintaining long-term mutually beneficial relationships with industrial and societal partners. Furthermore, the administrative unit is among the first higher education institutions to offer further education on sustainable digital transformation. In this way, through its graduates, the administrative unit can have multiplier effects in supporting sustainable development. It also stimulates sustainable digital practices through its collaboration with industry.

High quality research is a priority – this is recognised internationally, most notably by the Association for Information Systems – and this influences and is reflected in the way teaching, research administration and planning and societal engagement are achieved. The department views its investment in research as an effective way to be relevant to society and contribute to sustainable development. This is reflected in the three impact cases that have been submitted. These present a comprehensive overview of the impact of the unit's activities on key its stakeholders, that is, the research community, educators and civic society.

5.1 Impact cases

Comments to impact case 1: Strengthening resilience management through information systems

This impact case concerns the use of information systems for supporting resilience management. The concrete outcomes of this research include methods and tools for systemic risk management, exercise planning and evaluation. The impact case therefore has led to knowledge development in this important area and contributed to societal resilience through improving practice in crisis preparedness and management. The research brings together research results from three research projects, one funded by the EU Horizon 2020 project and two by RCN. The project Smart Mature Resilience (2015-2018) resulted in a European Emergency Management Guideline, for enhancing urban communities' capacity to resist, absorb and recover from the hazardous effects of climate change. The project INSITU - Sharing Incident and Threat Information for Common Situational Understanding (2019-2022) developed knowledge and solutions for effectively sharing information among different organisations involved in crisis response. The project SPRM - Systemic Pandemic Risk Management (2020-2023) has extended the methods developed in the first project for systemic analysis and management of interdependent risks. The project had significant impact as it helped evaluate the Covid-19 response in the Agder County in Southern Norway and provided knowledge for the effective management of future pandemics.

The Evaluation Committee finds that this is a relevant and important impact case, that has been thoroughly documented in research publications and project deliverables and in line with the administrative unit's research vision and CIEM's research centre's expertise.

Comments to impact case 2: Digital transformation of education

This impact case studied the implementation of 1:1 coverage of digital devices in all schools over a period of six years. This was the first of its kind to address digital transformations in schools with 1:1 coverage. This research has provided insights into educational development work in schools and showed the complexity of digital technology impact on education. In particular, it showed the value of an adapted, bottom-up approach that consider the needs of individual schools. The research started in 2018 and is ongoing.

The Evaluation Committee finds that this is a relevant and important impact case, in line with the administrative unit's expertise and research agenda. It has led to a number of publications as well as public interventions in the press, as well as multiple presentations to the relevant stakeholders (school owners, teachers, advisors, municipalities).

Comments to impact case 3: Responsible digitalisation of Public Welfare Services

This impact case describes the collaboration between the department and the Norwegian Labour and Welfare Administration (NAV) concerning issues related to the responsible digitalisation of public welfare services. This research started in 2018 and is ongoing. The research brings together research results from four research projects, two funded by NAV and two by RCN. The research combines analyses from the user's (citizen's) and the public organisation's perspective. In all research projects, the staff from the research group interacted via workshops and user evaluations with the relevant stakeholders, co-creating knowledge on AI use, in line with the University's strategic vision for knowledge co-creation.

The Evaluation Committee finds that this is a highly relevant and important impact case, as it concerns, inter alia, responsible use of AI and the inclusion of citizens within digitised service provision. The research outcomes have been thoroughly documented and include research publications in highly ranked journals, such as the European Journal of Information Systems (among the top in the IS field) and Government Information Quarterly (very highly ranked niche journal).

Methods and limitations

Methods

The evaluation is based on documentary evidence and online interviews with the representatives of Administrative Unit.

The documentary inputs to the evaluation were:

- Evaluation Protocol that guided the process
- Terms of Reference
- Administrative Unit's self-assessment report
- Administrative Unit's impact cases
- Administrative Unit's research groups evaluation reports
- Bibliometric data
- Personnel and funding data
- Data from Norwegian student and teacher surveys (only for HEIs)

After the documentary review, the Committee held a meeting and discussed an initial assessment against the assessment criteria and defined questions for the interview with the Administrative Unit. The Committee shared the interview questions with the Administrative Unit two weeks before the interview.

Following the documentary review, the Committee interviewed the Administrative Unit in an hour-long virtual meeting to fact-check the Committee's understanding and refine perceptions. The Administrative Unit presented answers to the Committee's questions and addressed other follow-up questions.

After the online interview, the Committee attended the final meeting to review the initial assessment in light of the interview and make any final adjustments.

A one-page summary of the Administrative Unit was developed based on the information from the self-assessment, the research groups' evaluation reports, and the interview. The Administrative Unit had the opportunity to fact-check this summary. The Administrative Unit approved the summary with minor adjustments.

Limitations

The Committee judged the information received through documentary inputs and the interview with the Administrative Unit sufficient to complete the evaluation.

List of administrative unit's research groups

Institution	Administrative Unit	Research Groups
University of Agder (UiA)	Department of Information Systems (IIS)	Centre for Integrated Emergency Management (CIEM)
		Centre for Digital Transformation (CeDiT)

Terms of Reference (ToR) for the administrative unit

The Department of Information Systems at the University of Agder (UiA) mandates the evaluation committee appointed by the Research Council of Norway (RCN) to assess the Department of Information Systems at UiA based on the following Terms of Reference.

Assessment

You are asked to assess the organisation, quality and diversity of research conducted by the Department of Information Systems at UiA as well as its relevance to institutional and sectoral purposes, and to society at large. You should do so by judging the unit's performance based on the following five assessment criteria (a. to e.). Be sure to take current international trends and developments in science and society into account in your analysis.

   a) Strategy, resources and organisation
   b) Research production, quality and integrity
   c) Diversity and equality
   d) Relevance to institutional and sectoral purposes
   e) Relevance to society

For a description of these criteria, see Chapter 2 of the mathematics, ICT and technology evaluation protocol. Please provide a written assessment for each of the five criteria. Please also provide recommendations for improvement. We ask you to pay special attention to the following 3 aspects in your assessment:

1.   Relevance and impact to society

2.   Interdisciplinarity

3.   Networking and international community

In addition, we would like your report to provide a qualitative assessment of the Department of Information Systems at UiA as a whole in relation to its strategic targets. The committee assesses the strategy that the administrative unit intends to pursue in the years ahead and the extent to which it will be capable of meeting its targets for research and society during this period based on available resources and competence. The committee is also invited to make recommendations concerning these two subjects.

Documentation

The necessary documentation will be made available by the mathematics, ICT and technology secretariat at Technopolis Group.

The documents will include the following:

- a report on research personnel and publications within mathematics, ICT and technology commissioned by RCN
- a self-assessment based on a template provided by the mathematics, ICT and technology secretariat

Interviews with representatives from the evaluated units

Interviews with the Department of Information Systems at UiA will be organised by the evaluation secretariat. Such interviews can be organised as a site visit, in another specified location in Norway or as a video conference.

Statement on impartiality and confidence

The assessment should be carried out in accordance with the Regulations on Impartiality and Confidence in the Research Council of Norway. A statement on the impartiality of the committee members has been recorded by the RCN as a part of the appointment process. The impartiality and confidence of committee and panel members should be confirmed when evaluation data from the Department of Information Systems at UiA are made available to the committee and the panels, and before any assessments are made based on these data. The RCN should be notified if questions concerning impartiality and confidence are raised by committee members during the evaluation process.

Assessment report

We ask you to report your findings in an assessment report drawn up in accordance with a format specified by the mathematics, ICT and technology secretariat. The committee may suggest adjustments to this format at its first meeting. A draft report should be sent to the the Department of Information Systems at UiA. The Department of Information Systems at UiA should be allowed to check the report for factual inaccuracies; if such inaccuracies are found, they should be reported to the mathematics, ICT and technology secretariat within the deadline given by the secretariat. After the committee has made the amendments judged necessary, a corrected version of the assessment report should be sent to the Department of Information Systems at UiA and the RCN no later than two weeks after all feedback on inaccuracies has been received from The Department of Information Systems at UiA

Appendices

1. Description of the evaluation of EVALMIT
2. Invitation letter to the administrative unit including address list
3. Evaluation protocol
4. Template of self-assessment for administrative unit (short-version)